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REVIEW OF THE CURRENT SITUATION AND OUTLOOK FOR IRON ORE - 1992

Report by the UNCTAD secretariat

This report describes developments in the world iron ore market in 1991 and in the first half of 1992. The main purpose of the report is to stimulate an exchange of views on the current situation and outlook for the international iron ore market. Detailed statistics appear in the document entitlted "Iron ore statistics 1982–1991" (TD/B/CN.1/IRON ORE/2) prepared by the UNCTAD secretariat.

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I. OVERVIEW AND SUMMARY

1. In 1991, although iron ore demand softened, trade remained relatively stable, and the world iron ore industry embarked on an ambitious expansion programme. Global consumption of iron decreased 4 per cent because the continuous growth in demand from Asian countries was insufficient to offset the sharp drop taking place in Eastern European countries and the impact of the American recession. Since the last quarter of 1991, iron ore market conditions have been fast deteriorating, reflecting the slowing down of the world economy and the weak steel developments, particularly in Japan. This less favorable situation is forecast to prevail throughout 1992.

2. World production of iron ore totalled 945 million tons in 1991, being 3 per cent lower than in 1990. This decline was entirely due to the drastic fall of over 15 per cent in the former USSR iron ore output. With the disintegration of the former Union of Soviet Socialist Republics, Ukraine emerged as a major iron-ore producing country even if its output was almost 20 million tons lower in 1991. In contrast, remarkable increases of iron ore production took place in Australia and India. As regards world apparent consumption, estimated at 937 million tons of iron ore in 1991, the decline was more accentuated because, in addition to the drop in iron ore consumption in Eastern European countries, a considerable decline also occurred in the United States. In other regions, the level of iron ore production and consumption remained relatively stable, following the same trend as in 1990, but pellets and lumps were more affected by lower demand than were fines.

3. Thanks to the continuous dynamism of the Asian markets, world trade in iron ore remained strong in 1991 since nearly 396 million tons entered into the international market. Iron ore trade reached the record value of US$8.55 billion dollars, ranking first in terms of trade value and volume among the non-precious ore commodities. Iron ore also retains an important place in the balance of trade of its major exporting countries; at present, iron ore is the export earnings product no. 1 for Brazil and Mauritania, and no. 5 for Australia. In view of the big increase in Australian exports, the recovery of Canada, the sharp drop in exports from the former USSR and the near disappearance of Liberia from the international iron ore scene, the year of 1991 pointed to important changes in the market share of the 10 major exporting countries. On the importing side, the ever-growing level of iron ore imports into the Republic of Korea and China contrasted with the generalized fall of imports into the Eastern European countries. Japan reinforced its position as the world's largest importer, but Germany's market share remained unchanged despite the addition to its territory since reunification.

4. In a climate of tight supply/demand balance the recovery of iron ore prices continued in 1991. The negotiated benchmark agreed by Australia and Japan was for a rise of 7.93 per cent for fines, 5.95 per cent for lumps and about 1 per cent for pellets. Price differentials continued to be applied uniformly in the Japanese and European markets for all brands according to quality specifications. For 1992, however, as demand had started going down towards the end of 1991, stocks were high but production failed to be promptly adjusted downward, market forces favoured iron ore buyers. As a result, in a relatively smooth round

of negotiations, iron ore prices declined between 5 and 7 per cent in 1992. This drop reflected, on one side, the tendency of major suppliers to favour long-term assurance of higher contracted tonnages to the detriment of temporary price increases; on the other side, it also resulted from the pressure of steelmakers to cut commodities prices in order to alleviate their deteriorating financial position aggravated by low steel prices.

5. A recent review of the performance of individual iron ore companies makes more transparent the gradual, but widespread, expansion capacity programme which the world iron ore industry is undergoing. Too many companies are considering ambitious capacity expansions at the same time. While the need for some new investments or re-investment decisions exists, the current slowing down of the market might contribute to scaling down some over-optimistic plans.

6. The first half of 1992 gave evidence of the changing economic environment of the world economy. The mild recovery taking place in the United States contrasted sharply with the slowing down of the Japanese and German economies, which had been overheated since 1989. As Japan and Germany are the major markets for iron ore, the overall impact for the iron ore market is not easily absorbed. Therefore, 1992 is proving to be a difficult year for the iron ore industry since prices decreased, investments increased, stocks are high, trade is declining, and in addition the market equilibrium is losing momentum because supply is expanding at a time when demand is contracting.

7. The outlook for 1993 is more optimistic. Despite the uncertainties about the timing and strength of the steel recovery in developed countries, it is felt that the worst has already passed, and steel demand is expected to start picking up gradually late in 1992, reaching more stable levels in 1993. As a result, for 1993 world iron ore demand is likely to stabilize and prices may be influenced by the already improved level of steel prices in 1992, and the better steel outlook for 1993.

II. FEATURES INFLUENCING IRON ORE DEMAND

8. Total demand for iron ore weakened in 1991. World apparent consumption amounted to 937 million tons, being 4 per cent lower than in 1990. Behind this market contraction was the sharp drop of iron ore consumption in Eastern Europe, and to a lesser extend in the United States. In contrast, in Japan, China and the Republic of Korea iron ore consumption continued booming in 1991, while in other regions it remained relatively stable (table 1). As regards iron ore products, pellets and lumps were more affected by lower consumption than fines.

Table 1
Apparent consumption of iron ore
(million tons)

Regions or countries	1982	1985	1989	1990	1991
Developed countries	358.0	382.5	400.1	391.2	373.6
of which:					
EEC	132.7	145.3	148.9	137.1	134.4
Japan	122.2	124.9	128.0	125.5	127.4
United States	48.8	60.4	73.3	71.3	64.8
Developing countries	93.8	114.7	142.9	146.4	155.0
of which:					
Asia	44.2	45.2	68.4	73.3	85.5
Latin America	37.8	54.9	59.6	59.9	57.9
Africa	8.3	7.0	8.2	7.6	7.6
Countries of Eastern Europe	259.3	266.4	257.1	247.5	204.9
of which:					
Former USSR	201.6	203.8	201.4	199.7	171.5
Socialist countries of Asia	118.1	148.7	184.4	193.9	204.0
of which:					
China	109.6	140.4	174.4	183.7	193.9
World total	829.3	912.3	984.6	979.0	937.5

Source: UNCTAD secretariat - "Iron Ore Statistics 1982-1991".

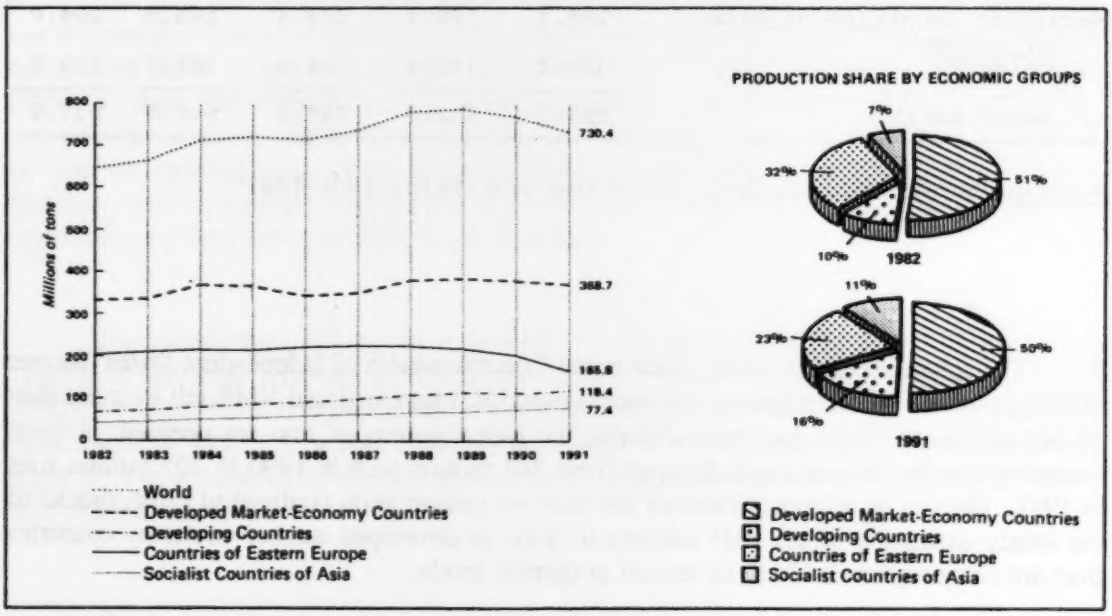
9. The severe recession taking place in the Commonwealth of Independent States (former USSR) as well as in other Eastern European countries, where regional NMP fell by more than 25 per cent since 1988[1], has been affecting the global pattern of iron ore demand. In these countries iron ore consumption dropped from 247 million tons in 1990 to 205 million tons in 1991. Only in developing countries did iron ore consumption continue to grow, thanks to the steady expansion of the steel industry in Asia. In developed market-economy countries iron ore consumption is likely to remain at current levels.

10. The first half of 1992 saw a further decline of iron ore demand, due to the slowing down of the world economy and the consequent cutbacks in iron and steel production, particularly in Japan. This situation was aggravated by the higher level of iron ore stocks carried over from 1991.

A. Steel production

11. The steel market in 1991 was characterized by lower production, low prices and high stocks. World crude steel production amounted to 730 million tons, about 5 per cent lower than in 1990. Although the overall fall had been steeper than expected, steel developments were very different from region to region. Sharp declines in steel production occurred in the former USSR and other Eastern European countries (–18 per cent), and in the United States (–10 per cent). With the enlargement of Germany's territory there was a moderate increase of steel output in the EEC area, while in Japan the high level of steel production was maintained. In most developing regions namely China, other Asia, Africa and Middle East steel production increased, except in Latin America.

Chart 1
WORLD PRODUCTION OF CRUDE STEEL



Source: UNCTAD secretariat

12. In developed market–economy countries total crude steel production was nearly 9 million tons lower in 1991, reflecting the slowdown in general economic activity (GNP grew by 1.1 per cent in 1991 compared to 2.8 per cent in 1990). This led to lower investments, and reduced levels of industrial output and domestic steel demand in most countries[2]. Shipbuilding was the only major steel–consuming sector which remained firm. During the second half of 1992 steel demand is expected to start rising again, but the annual level of crude steel output in the OECD area is likely to remain more or less the same as in 1991.

Table 2

Major steel-producing countries, 1982-1991
(million tons)

	Country	1982	1985	1989	1990	1991	1991/90 change (%)
1.	Former USSR	147.1	154.7	160.1	154.3	132.7	-14.0
2.	Japan	99.5	105.3	107.9	110.3	109.6	-0.6
3.	United States	67.6	80.1	88.9	88.9	79.7	-10.3
4.	China	37.0	46.8	61.4	66.3	70.4	+6.2
5.	Germany*	35.9	40.5	41.1	38.4	42.2	+9.7
6.	Republic of Korea	11.7	13.5	21.9	23.1	26.1	+13.1
7.	Italy	24.0	23.9	25.2	25.5	25.0	-1.5
8.	Brazil	13.0	20.5	25.0	20.6	22.6	+9.9
9.	France	18.4	18.8	18.7	19.0	18.4	-3.3
10.	United Kingdom	13.7	15.7	18.8	17.9	16.5	-7.5
	World total	645.1	718.8	784.7	767.2	730.3	-4.8

Source: UNCTAD secretariat - "Iron Ore Statistics 1982-1991".
* For 1991, unified territory.

13. In Japan, the level of crude steel production remained very high in 1991 at 109.6 million tons, only -0.6 per cent lower than its record of 1990. However, since the last quarter of 1991 the Japanese economy which is driven by domestic demand, is growing less strongly (GNP growth of 5.6 per cent in 1990 compared to 4.5 per cent in 1991, and foreseen to drop further to 2.4 per cent in 1992 and 3.5 per cent in 1993)[3]. As a result public and private investment declined, affecting in particular the housing, automobiles and the industrial and electric machinery industry. The sharp contraction of the steel market in Japan became more evident during the first half of 1992, when crude steel production during the first six months of the year was 14 per cent below the level of 1991, and the annual forecast for 1992 crude steel production was revised downward to around 100 million tons. However, it is felt that the bottom has been already reached, and an upswing is expected in late 1992, particularly because lower interest rates are expected to re-stimulate public investments according to the new "Public Investment Basic Plan".

14. Western Europe saw in 1991 a generalized decline of steel production in almost all countries. In the EEC crude steel production was 137.5 million tons. In the European Community while inflation decreased to about 5 per cent, investments slowed down and the foreign trade balance was negative in 1991, mainly due to higher imports into the unified Germany. Even if steel production in the Eastern territories of Germany currently represents less than 10 per cent of total German output, with the unification, Germany strengthened its position as the largest steelmaking producer and iron ore consumer in Europe. However, due to the territorial enlargement overall economic growth is softening in Germany; the steel industry of the new territories are being privatized, some steel capacity has been already reduced, but Germany total steel capacity is expected to remain unchanged in 1992 at the level of nearly 49 million tons. During the period January-June 1992 crude steel production within the EEC was virtually at the same level as in 1991, but the activity of the main consuming sectors is likely to pick up during the second half of the year, favoured by the momentum of the completion of the internal market at the end of 1992.

15. In the Commonwealth of Independent States (CIS) (former USSR less the Baltic Republics and Georgia) and other Eastern European countries the level of steel production and consumption continues to fall drastically for the third consecutive year. The former USSR remained, however, the world largest crude steel producing country, even if the further drop of 14 per cent in 1991 brought its total output to 133 million tons, its lowest level since 1973. Recent cutbacks in steelmaking in the former USSR also resulted from the shortage of raw materials, in particular coal and scrap. Future steel developments in the CIS region will greatly depend on the relations between the two main steel-producing republics namely Russia responsible for about 60 per cent of total CIS steel production and Ukraine which accounts for about 35 per cent. It seems, however, that the current lower level of steel output in this area reflects a more rational pattern of production, and probably a more realistic consumption level. Nevertheless, the crisis of the CIS steel industry has far-reaching consequences for the overall economy, and the picture remains dark. Steel production in the CIS republics further dropped by 12 per cent during the first half of 1992 as compared with the same period in 1991.

16. The adjustments needed to make effective the transition of the Eastern European countries from a centrally-planned to a market economy made 1991/1992 a very critical period for the region, characterized by depressed levels of output and investments and rising inflation and unemployment. Some progress towards economic change has been achieved in Poland, Hungary and to a lesser extend in Czechoslovakia, but elsewhere progress has been slower, or even blocked by lack of political consensus.[4] In addition to the steep decline in the former USSR, crude steel production in 1991 also fell sharply (by 18 to 30 per cent) in the Czechoslovakia, Hungary Poland, Romania and Bulgaria; altogether steel output was 37 million tons lower in the region (excluding also steel production of the former German Democratic Republic). As the restructuring in the Eastern European countries is far from being completed, modernization and further cutbacks in steel capacity seem inevitable. Therefore, crude steel production in the region is likely to further decline. Figures for the four first months of 1992 already indicated an additional drop of over 20 per cent for the countries in Eastern Europe.[5]

17. In the United States the steel industry in 1991 was severely affected by the recessionary level of investments, which hit in particular the most steel intensive consuming sectors such as the motor vehicle industry and construction. Since the first quarter of 1992, the economic recovery pushed up steel production in the United States, which was 9 per cent higher as compared with the same period of 1991. These more favourable conditions are expected to prevail throughout the year.

18. Steel production in China continues to grow rapidly and surpassed 70 million tons in 1991. Despite the relatively low level of investments over the last decade, demand for steel in the Chinese market has grown on average by 10 per cent a year, led by the requirements for infrastructure, housing and demand for consumer durables. More recently guided by the economic reform, its favourable geographical location and availability of iron ore and coal, China is also exporting about 2.5 million tons of steel products to the Asian market.

19. The expansion of the steel market in developing countries of Asia has been remarkable, with an additional 6.5 million tons in 1991 a total of 74.5 million tons of crude steel was produced in the region. Led by a spectacular growth rate (GNP growth of 8.6 per cent in 1991), steel consumption in the Republic of Korea increased by 17 per cent in 1991 and crude steel production reached 26 million tons. The construction industry accounts for about half of Korean steel consumption, but the automobile industry and shipbuilding are also important sectors. In 1992 however, the Korean steel market may grow less fast, but with the completion of the fourth stage of POSCO's production capacity, Korean annual steel output is expected to reach 27 million tons. Since the Republic of Korea, like Japan, relies almost exclusively on iron ore imports, its iron ore requirements are likely to reach up to 32 million tons in the near future. In India steel production is also increasing. In 1991, India almost joined the group of the ten major world steelmaking countries with a production of 16.4 million tons.

20. In Latin America the long-lasting economic recessive scenario started showing signs of recovery in 1991. However, the increase in the regional GNP of about 3 per cent, has not yet had the expected impact on the Latin America steel industry. Total regional output was lower than 39 million tons[6], mainly due to declines in Mexico, Argentina and Venezuela. In Brazil, the largest producing country in the region, output has shown some recovery, at 22 million tons in 1991, but this level is still below its record of 25 million tons produced in 1989. Important events are however re-shaping the Latin American steel industry: (i) the privatization process taking place in Brazil, Mexico and Argentina; (ii) the liberalization of internal steel prices; (iii) the rationalization and technological modernization of many steel plants aiming at greater productivity and better international competitiveness; and (iv) last but not least, the agreement signed in April 1992 by the steel industry associations of Brazil, Argentina, Uruguay and Paraguay under the MERCOSUL (Southern Cone Common Market) accord, for the elimination of all steel trade barriers among member countries by the end of 1994.[7] During the first half of 1992 the steel industry of Latin America is gradually rebounding, a trend which might prevail all over the year.

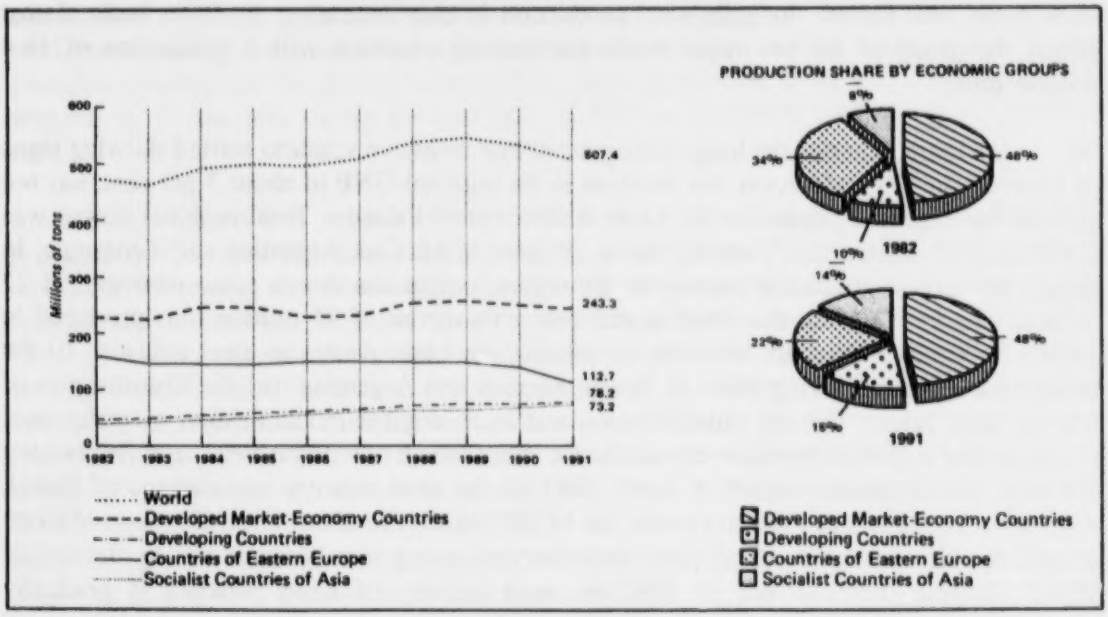
21. In developing Africa the level of steel production and consumption remains extremely low at 2.8 million tons. In 1991 only Egypt and Tunisia slightly improved steel output. In the Middle-East, steel output was close to 5 million tons in 1991, as a result of expanded steel capacity in Iran.

B. Pig iron production

22. In 1991, world pig iron output declined to 507 million tons, nearly 5 per cent below the level of 1990. Despite the continued growth of electric furnaces, hot pig iron remains the main input for steelmaking worldwide and it is in the blast furnaces that most iron ore is really consumed. The chart below shows that nearly half of total pig iron output is produced in developed market-economy countries, but more recently developing countries including China, are expanding their ironmaking capacity. As in the case of steel, the sharpest fall in pig iron production took place in the former USSR where output in 1991 was almost 20 million tons lower because of the shortage of coke caused by the coal miners' strike. Apparently, more than

30 blast furnaces became temporarily idle in the former USSR during 1991. Pig iron output in the United States also decreased to 44 million tons, while in Japan the level of 80 million tons was maintained. In China, the Republic of Korea, Brazil and India pig iron production increased.

Chart 2
WORLD PRODUCTION OF PIG IRON



Source: UNCTAD secretariat

23. The trade volume of solid pig iron remains small, representing about 2 per cent of total output. It is estimated that only 10 million tons entered into the world market in 1991. However, depending on its price competitiveness vis-a-vis other ferrous metallics and the elimination of trade barriers in some markets, pig iron trade can potentially be expanded. Technical advances are recently allowing growing consumption of pig iron in electric furnaces where a mix containing up to 15 per cent of pig iron can be used nowadays[8]. The contraction of the steel market and lower availability of pig iron from the former USSR, pushed pig iron trade down in 1991. Pig iron imports into Japan were about 3.3 million tons in 1991 but are likely to decline to about 2 million tons in 1992. Major exporters are the former USSR, Brazil and South Africa.

Table 3 - Pig iron trade

(million metric tons)

Major Exporters	1990	1991	Major Importers	1990	1991
Former USSR	6.3	3.2e	Japan	3.3	3.4
Brazil	3.5	2.6	Eastern Europe	4.0	2.6e
South Africa	0.7	0.5	Western Europe	3.7	3.2e
T O T A L incl.others	12.0e	10.0e	T O T A L incl. others	12.0e	10.0e

Source: UNCTAD Iron Ore Statistics, 1982-1991.
e - estimates

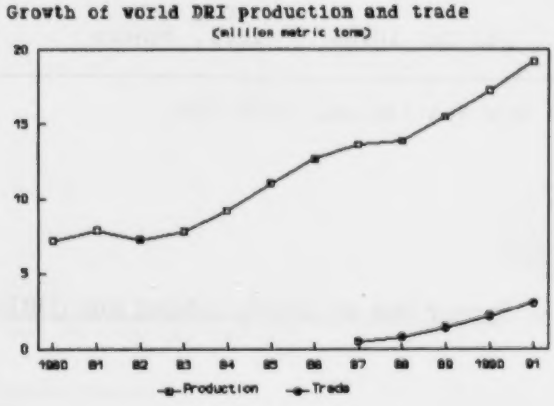
C. Sponge iron or directly reduced iron (DRI)

24. Despite the contraction of the steel market, DRI output continues to grow. In 1991, world production of sponge iron rose by 8 per cent reaching 19.2 million tons, although it accounts for only 2 per cent of the world requirements of ferrous metallics. The driving force behind DRI demand is the changing pattern of steelmaking, where the EAF (electric arc furnaces) route continues to increase (nearly 28 per cent of world steel output) and the combination DR/EAF facilities is proving an attractive and cost-effective alternative, particularly for newly established steel industries located in countries with availability of natural gas and/or iron ore. The consistent quality of sponge iron, which is essential for the production of high quality steel products, is also playing in favour of the growing demand for DRI.

25. DRI price which is somehow comparable in value with premium scrap No.1, is another factor influencing the choice of mini-mills. The stability of HBI (hot briquetted iron) prices seems an advantage if compared with the volatility of scrap prices. More recently, there is a move towards the establishment of an intrinsic value for DRI, focusing on the need to produce clean steels, independently of the level of scrap prices[9].

26. World DRI production capacity continues to expand, and more than 90 per cent of the plants in operation are gas-based. In 1991, as new plants started in India and Islamic Republic of Iran total installed capacity reached 29.5 million tons[10]. However, the capacity utilization remains rather low, since last year about 10 million tons of capacity was unused for various reasons. In contrast, more than 12 million tons of new capacity was under construction in 1991, of which 1 million ton for replacement. In summary, the total capacity of DRI plants installed and under construction presently amounts to 40.5 million tons. This gives an indication of the potential of iron ore demand, in particular for lumps and DRI-pellets, to meet the growing needs of the DRI plants during this decade.

Chart 3

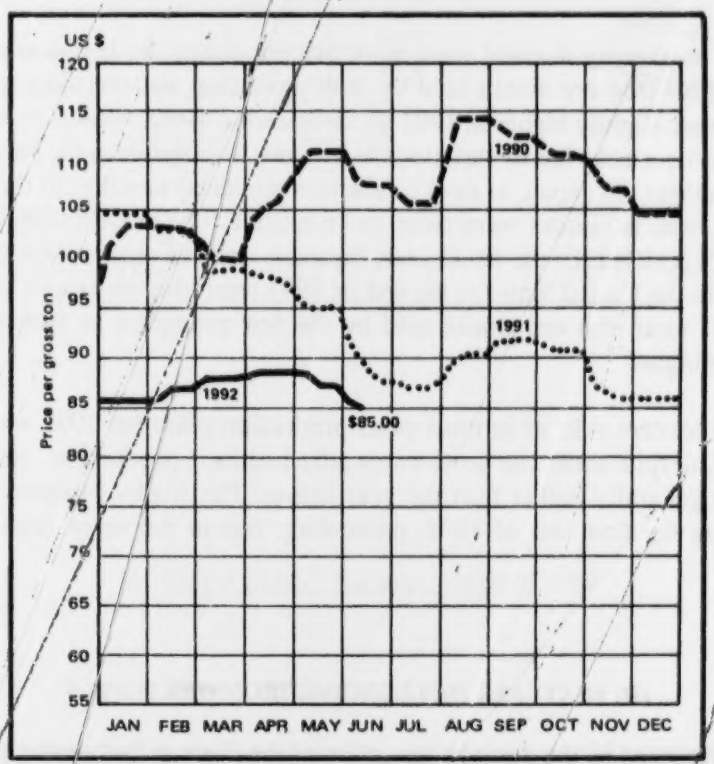


27. In 1991 world trade of DRI and HBI (the form of DRI most suitable for shipments) apparently increased to 3 million tons. Traditionally all the sponge iron was produced to feed domestic steel works, and only the exceeding output was traded. This explained the marginal level of DRI trade, and the existence of only two DRI exporting countries, namely Venezuela and Malaysia. However, during the last few years, the growing interest for this product is changing this pattern and some newly commissioned plants are also exported-oriented. Venezuela has great comparative-advantage in this area, and is strengthening its position as leading DRI-producer and exporter. India is another example where DRI production is planned to expand very fast from the current 1.2 million tons to nearly 6 million tons by 1994/95. In 1991, Venezuela produced 3.8 million tons, and increased its exports. Mexico produced about 2.5 million tons and the former USSR, India, Indonesia and Saudi Arabia each produced more than 1 million tons. Noteworthy was the appearance of DRI from the former USSR in the United States market[11].

D. Ferrous scrap

28. Global demand for ferrous scrap declined in 1991. The scrap market was not only affected by lower demand, but has also been hit by depressed prices since June 1991 (chart 4). Noteworthy however is that inspite of the continued growth of electric mills, consumption of ferrous scrap by the steel industry is declining. According to the Institute of Scrap Recycling Industries, in the United States, the second largest scrap consuming country, the use of scrap by the US steel mills and foundries fell to its lowest level in 1991; the share of scrap in steelmaking declined to less than 40 per cent, and the US exports were down by nearly 20 per cent in 1991 as compared to 1990[12]. Quality deterioration remains a major concern.

Chart 4
EVOLUTION OF SCRAP PRICES
Metal Market Weekly Steel Scrap Price Composite



Source: American Metal Market, June 1992.

29. About 35 million tons of ferrous scrap is traded in the world market, mainly intra-regionally since seaborne scrap trade is around 15 million tons. In 1991 scrap trade declined and important trade shifts became more visible. Exports from the United States declined from 11.6 in 1990 to 9.3 million tons in 1991. India, a major importer withdrew from the market due to foreign exchange problems, and Turkey a traditional importer from the US and EEC started buying from Eastern European countries [13]. Furthermore, Japan is becoming a competitor of the United States in the ever-increasing Asian markets. Another question is whether the future availability of scrap in the world markets will suffer, if the predicted growth of electric mills will led to a rise of scrap demand in major scrap generating countries.

Table 4 - Major ferrous scrap traders
(million metric tons)

Major exporters	1990	1991	Major importers	1990	1991
United States	11.6	9.3	Italy	6.0	5.5 e
Germany*	5.0	7.3	Spain	4.3	4.3
France	3.7	3.4	Rep. of Korea	3.9	3.5
United Kingdom	3.9	3.2	Turkey	3.8	4.4
Former USSR	2.7	n.a.	India	2.2	n.a.
T O T A L incl. others	38.0	n.a.	T O T A L incl. others	36.0	n.a.

Source: UNCTAD and IISI
e - estimate
* For 1991, unified territory

E. Iron ore stocks

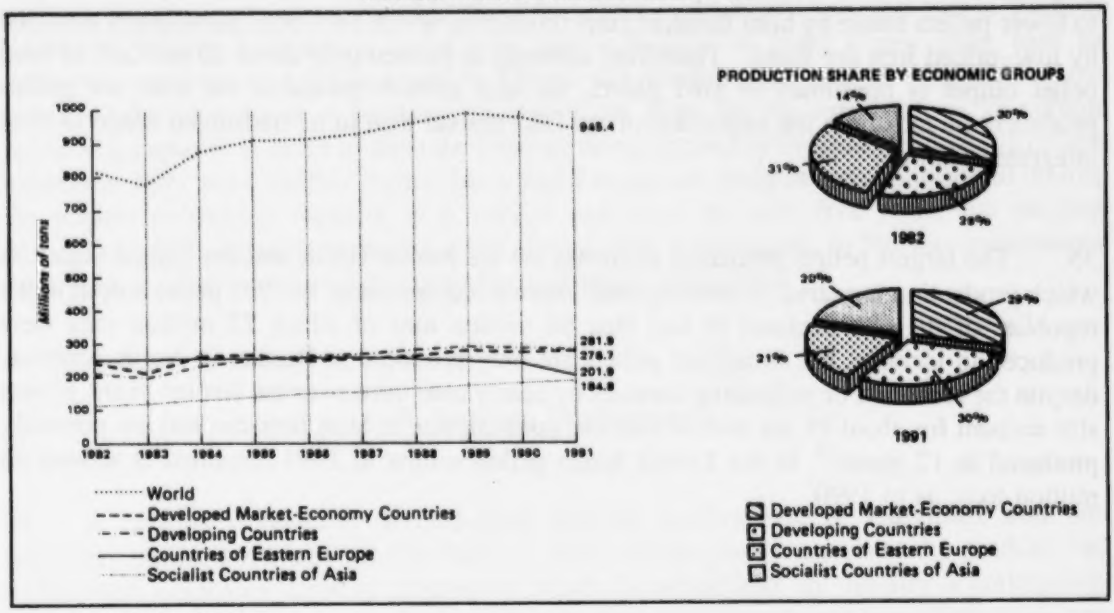
30. As signs of weakening demand were more evident during the last quarter of the year, in general, the level of iron ore stocks held by both producing and consuming countries at the end of the year were slightly higher in 1991 as compared to 1990. However, different degrees of steel production cutbacks led to variations in iron ore inventories in the Japanese, American and European markets. In Japan, as steel production remained steadily till the end of the third quarter of 1991, iron ore stocks were close to 16 million tons in December 1991. However, as tonnages are negotiated for the fiscal year, Japanese iron ore stocks were higher by the end of March 1992. In the United States at the end of 1991 total iron ore stocks were 28.4 million tons. In the EEC total iron ore stocks held by the few producers as well as by most steel works were also higher[14].

31. From the producers side, as in most cases production plans for 1991 were maintained at optimistic levels, despite some late downwards adjustments in production, stocks carried over from 1991 were generally higher than the year before. The stocks situation has been further aggravated during the first half of 1992, particularly due to the sharp drop in shipments to Japan.

III. FEATURES INFLUENCING IRON ORE SUPPLY

32. Strongly influenced by the drastic contraction of the Eastern European steel market, world production of iron ore declined from 976 in 1990 to 945 million tons in 1991. However, the supply capacity of most iron ore exporting countries remained stable all over the year and kept pace with the sustained level of iron ore trade. With the disintegration of the former Union of Soviet Socialist Republics, Ukraine emerged as a major iron ore producer, despite its lower level of iron ore output in 1991. Sharp declines in iron ore output continued in the former USSR and Liberia, while considerable increases occurred in Australia and China. In most other major iron ore producing countries the level of output in 1991 was more or less the same as in 1990. In terms of iron content, global output was 536 million tons giving the world average of 57 per cent Fe.

Chart 5
WORLD PRODUCTION OF IRON ORE



Source: UNCTAD secretariat

A. World market for agglomerated ores

Sinter

33. Reflecting the overall reduction in pig iron production, world sinter output declined to 521 million tons in 1991. This reduction (23 million tons lower than in 1990) would have been sharper if it had not been pushed by the steady level of sinter output in the Asian markets. Total sinter produced in Eastern European countries dropped by 14 per cent in 1991[15], mainly because output in the former USSR fell from 143 million tons in 1990 to 119 million tons last year. Nevertheless, for environmental and productivity reasons, the rehabilitation of older sinter plants in the region continues although at much slower pace. In other regions, the level of sinter production remained relatively unchanged, even if the most polluting plants are being closed.

Pellets

34. The market for pellets has been more affected by recent weaker steel market conditions. In 1991, world pellet production further declined to 211 million tons. Over the last two years, despite the firm demand for DRI pellets, overall pellets production considerably declined due to lower pellets intake by blast furnaces steel producers, which have been particularly attracted by low-priced iron ore fines. Therefore, although at present only about 10 per cent of total pellet output is consumed in DRI plants, the best growth prospects for iron ore pellets producers lie mostly in the expansion of the DRI market than in its traditional usage in steel integrated plants.

35. The largest pellets producing countries are the former USSR and the United States, in which production is geared to meeting their internal requirements. In 1991 pellet output in the republics of the CIS declined to less than 60 million tons of which 22 million tons were produced in Ukraine, but metallized pellets are only produced in Russia. In North America, despite the reduction of pelletizing capacity by nearly one-third over the last ten years, pellets still account for about 85 per cent of iron ore consumption in blast furnaces and are presently produced in 12 plants[16]. In the United States pellets output in 1991 remained at around 55 million tons, as in 1990.

Table 5

World pellet exports, 1987-1991
(million tons)

Country	1987	1988	1989	1990	1991
Brazil	20.0	23.8	23.3	20.0	24.0
Canada	13.1	17.6	17.3	14.6	14.4
Former USSR	10.8	10.9	11.5	12.3	10.0
Sweden	6.1	6.5	6.5	6.5	6.4
United States	5.0	5.2	2.9	3.0	4.0
Chile	3.3	3.5	3.6	3.4	3.8
India	0.8	1.6	1.9	1.7	1.7
Venezuela	0.4	0.8	1.2	1.2	0.9
Australia	2.1	2.0	1.6	1.7	0.7
Peru	1.7	1.5	1.5	1.2	0.8
Norway	-	1.1	1.0	1.2	1.3
Liberia	3.2	3.2	3.3	1.5	0
World total	66.7	75.7	74.9	72.5	68.1

Source: UNCTAD secretariat - "Iron Ore Statistics 1982-1991".

36. Trade in pellets weakened in 1991, but major export-oriented pellets producers maintained their market position, except Liberia where production ceased (table 7). Brazil remains the largest exporter and shipments were maintained at the level of 24 million tons in 1991. In Canada the capacity reduction over the last two years led to a decline in pellets output and exports which are now around 14.5 million tons. In Sweden the level of pellets production and exports remained virtually unchanged, although an increase of 1.5 million tons in Swedish present pelletizing facilities is under way, and a decision to build a new plant with an additional capacity of 4 million tons in Kiruna will reinforce the country's position in the world market. Venezuela is pursuing its investment plans for the expansion of its current pelletizing capacity in order to meet the ever-growing demand of its DRI plants. India pellets exports in 1991 were slightly higher, but a major expansion programme is planned to double the present pelletizing capacity to 6 million tons over the next five years; the existing Mangalore plant would be expanded and a second plant is envisaged. In Norway investments have been made to maintain its current level of pellet production.

B. Regional Developments

37. A review of regional developments and the performance of individual iron ore producers during 1991 and the first half of 1992, makes more transparent the gradual, but widespread, expansion capacity programme which the world iron ore industry is undergoing at a time of declining demand and prices. Most of the major producers have already, or are planning, to embark on additional capacity projects. At this stage, special attention is needed with a view to monitoring the market situation in order to maintain supply close to demand, in the interest of all involved.

Table 6

Major iron ore producing countries, 1982-1991
(million tons, natural weight)

	Country	1982	1985	1989	1990	1991	1991/90 Change (%)
1.	Former USSR	244.4	247.6	241.3	236.0	198.9	-15.7
2.	China	106.2	130.2	162.1	169.3	175.3	+3.5
3.	Brazil	93.1	128.2	153.7	152.3	150.7	-1.0
4.	Australia*	87.7	97.5	105.8	112.0	118.6	+5.9
5.	India	42.7	44.1	51.4	53.7	56.9	+6.0
6.	United States	37.1	49.5	59.0	56.4	55.5	-1.6
7.	Canada	35.6	39.8	41.1	35.6	35.9	+1.0
8.	South Africa	24.5	24.9	29.9	30.3	28.9	-4.4
9.	Venezuela	11.7	14.8	18.0	20.1	20.0	-1.0
10.	Sweden	16.1	20.3	21.8	19.9	19.3	-2.8
	World total	817.5	910.4	987.3	976.5	945.4	-3.3

Source: UNCTAD secretariat - "Iron Ore Statistics 1982-1991"
* Dry basis

1. Africa

38. In 1991 the already weaker position of African developing countries in iron ore trade was further aggravated due to the limited participation of Liberia in the international iron ore scene. Apart from South Africa where iron ore production remains at high levels, the African continent continues to lose share in the world iron ore market. Iron ore output from developing Africa in 1991 was only 18.5 million tons. As in many other commodities, problems in Africa are mostly related to production rather than trade.

39. In South Africa iron ore production slightly declined to nearly 29 million tons in 1991. Iscor, the fully-integrated South African steel producer, operates two iron ore mines: Sishen and Thabazimbi. The combined production of these mines is primarily to cover its own needs of about 9 million tons, and the excess ore is exported. In 1991, Iscor conquered new markets in Eastern Europe and the Far East, and for 1992 exports are planned to reach 15 million tons. Assoman, the other South African iron ore mining operator has a 5 million tons annual capacity, but its present output ranges around 3 million tons; in view of additional reserves and the introduction of heavy media separation facilities, this company is planning to improve its ore quality and expand exports.

40. In 1991 Mauritania produced 10.2 million tons of iron ore, (1.2 million tons less than the year before) entirely for exports. SNIM, the only iron ore mining operator in the country, continues to exploit the Kedia deposits which might be exhausted by 1996, and the Guelbs which remains at lower scale. Following recent financing arrangements the M'Haoudat project was launched in 1991 and it is expected to mine annually 6 million tons of ore for 15 years from 1993 onwards. In early 1992, iron ore extraction from a new small pit called TO14 also started. SNIM's target for 1992 is to focus on quality and to produce about 11 million tons. Pre-feasibility studies for the development of the pellet-feed deposit and a pelletizing plant under the El Aouj project have been carried out, and in May 1992 an agreement was signed by interested companies from Egypt, Algeria, Libyan Arab Jamahiriya and Mauritania to go ahead with this project, planned to meet the future demand for DRI pellets of the Arab countries.

41. In Liberia since the beginning of the civil war in 1990 iron ore mining has been seriously disturbed. The planned operations of the LIMINCO project have been severely affected, since mining restarted by mid-1991 after 10 months of closure. About 1.2 million tons of iron ore was produced in 1991, and for 1992 output and exports are planned to be about 2 million tons. The situation of Bong Mining is even worse, since its mining and pellets facilities were highly damaged, and its closure might be definitive.

42. Meanwhile, even if fighting has ceased and Liberia is returning to normality, the prospects for the joint Guinean-Liberian MIFERGUI project continues to be jeopardized. The start-up of this project which was previously envisaged for 1993 will inevitably be delayed, since a degree of political stability is a necessary prerequisite to its realisation. Efforts from the Guinean Government and the two groups involved in developing the equity investment of the project (BRGM and AMCL) seem to have retained the support of some potential consumers, but solid commitments have not yet been made.

43. For Senegal although the prospects for the MIFERSO project seems more favourable, the weaker 1991/92 market conditions softened general interest for greenfield projects. Pre-feasibility studies were carried out, and a bankable project document completed in April 1992 reduced the project capital costs by 20 per cent. Tests about the quality of the ore have been made and shipments are scheduled for early 1997, but concrete financing/supplier credit programs are still pending.

44. Algeria produced for domestic consumption about 3 million tons of iron ore in 1991, but in view of the planned expansion of Algerian iron and steel capacity, local iron ore production may be expanded in the future. Egypt and Zimbabwe produced respectively 2 and 1.5 million tons of iron ore in 1991 for local consumption. Very small quantities of iron ore continue to be mined in Morocco and Tunisia. In Angola recent co-operation with South Africa's Iscor has been established with a view to consider whether it is feasible to re-start iron ore mining in the country. In other African countries despite their potentialities, most iron ore pits do not seem to be technico-economically exploitable.

2. Asia

45. In Asia, where the bulk of iron ore production is concentrated in only two countries, regional iron ore output reached a new record in 1991. In China iron ore production continues to grow following the growing demand of the domestic steel industry. Despite its quality handicap, 175 million tons of iron ore were produced in 1991 from the various deposits located in 27 Chinese provinces. However, this large volume would correspond to only about 82 million tons of concentrates, which is insufficient to cover the local demand. The expansion of Chinese iron ore output may however reach a limit, since while small mines are still expanding it seems difficult to further increase production at large-scale mines, particularly due to problems of transportation and water supply for beneficiation. In addition, China's economic reforms and opening towards the world market is likely to favour higher imports of iron ore and greater exports of steel products to other developing Asian markets.

46. India also increased iron ore production to nearly 57 million tons in 1991. Higher output has been needed to meet the increasing domestic demand and maintain the current level of exports. Mining operations of three existing deposits are being gradually expanded, resulting in an increase of about 5 million tons by 1994. Furthermore, plans to raise the capacity of Bailadila mines by up to 8 million tons as well as to develop new mines during the next five years are under consideration. Output and exports from the Goan mines however were 2.5 per cent lower in 1991, and Kudremukh's production also slightly declined last year but higher tonnage is envisaged for 1992, and plans to increase the designed capacity for both concentrates and pellets plants are still on. A recent issue in India is that in view of the rising domestic demand, the decrease in iron export prices, and the liberalization of the Indian economy, the Government is considering to set a limit on the country's iron ore export policy, in order to stimulate local processing through the development of new iron and steel plants, possibly with foreign partners[17].

47. According to estimates iron ore output in the Democratic Peoples' Republic of Korea remained at the level of 9.5 million tons in 1991, exclusively meeting the needs of the domestic steel industry. In the Philippines sintered products made from imported ores totalled 4.75 million tons in 1991, but during the first quarter of 1992 the plants operated at a reduced rate due to a reduction of electric power supply affected by a water shortage; the quasi totality of Philippine's sinter is exported to Japan. In the Republic of Korea and Malaysia there are small mines and marginal quantities of iron ore are produced and these countries rely almost exclusively on imports. In Indonesia iron sand deposits were exploited in the past but proved uneconomical. In Thailand very small quantity of poor quality ore are still mined.

48. Studies to mine the high-grade deposits of Viet Nam are under consideration, but no decision has apparently been taken. Significant iron ore deposits exist in Lao People's Democratic Republic but as they are located in remote areas their exploitation might not be economically viable at present. Recently, new iron ore reserves have been discovered in Pakistan and feasibility studies will be carried out to investigate whether these deposits could be developed to feed local mini-mills.

3. Middle East

49. In 1991 the Islamic Republic of Iran produced more than 6 million tons of iron ore for blast furnaces and DRI consumption. Following the fast development of its iron and steel industry which is planned to double capacity by the end of the decade, a priority program for iron ore capacity additions is underway with the implementation of three projects. The most advanced, Gor-er-Gohar already in 1993 will provide for 2.7 million tons of concentrates and the two others will increase capacity by 8 million tons by 1995/96. Two new ore terminals are also under construction and will be used for both the import and export of iron ore and other minerals. In view of the Gulf war, the Bahrain pellet plant was not in full operation in 1991 but its annual capacity is for nearly 4 million tons, and might be expanded in the future depending on regional demand.

50. In the Middle East, in view of the abundance of oil and natural gas and the non-availability of coking coal and scrap, the most successful route for steelmaking is the DRI/EAF, which explains the growing concentration of DRI plants in the region. Directly-reduced iron is already produced in Saudi Arabia, Qatar, Libyan Arab Jamahiriya, Egypt, Islamic Republic of Iran and Iraq. In Iraq since the war the operational situation of the plant is unknown, but in most of the other countries of this region DRI production increased in 1991.

4. Eastern Europe

51. Total iron ore output of Eastern European countries sharply declined to 202 million tons in 1991, about 37 million tons lower than in 1990. As almost the totality of regional output comes from the former USSR, this reduction reflects the 16 per cent cut in iron ore production in the former USSR last year. Nevertheless, the combined iron ore output of the newly established republics of the CIS still represents more than 20 per cent of world total and was nearly 199 million tons in 1991. Their total production of concentrates declined by 10 per cent to 180 million tons due to the under-utilization of some concentration plants, particularly in Azerbaidjan. Ukraine alone produced nearly 87 million tons of iron ore in 1991 compared to 106 million tons in 1990. In the CIS republics most of the deposits are open pit mines but extraction costs are very high owing to the depth of the open-cast pits (up to 600 meters in certain cases), and the low Fe-content of the ores which makes it necessary to extract huge volumes of run-of-mine. Gradually, efforts to improve the productivity of the mines through the use of better equipment is helping to reduce ore losses, and in the longer run may reduce production costs.

52. In Czechoslovakia, despite the 12 per cent drop in pig iron output, the level of iron ore production was maintained at 1.7 million tons, while iron ore imports declined in 1991. In Bulgaria and Romania iron ore production fell to about 800 and 500 thousand tons respectively last year. In Hungary and Poland iron ore reserves were completely exhausted some years ago.

5. Rest of Europe

53. Iron ore production in the EEC region continues to decline year after year, as a result of the closure of unprofitable mines, a process which is not yet completed. In 1991 total output of EEC countries totalled 11.6 million tons. Among the 12 countries, France remains the main iron ore producer although its output declines every year, 7.5 million tons in 1991 compared to 8.7 million the year before, because at present only 2 mines remain in operation. Spain produced nearly 4 million tons of iron ore in 1991, but the future operations of Cia. Andaluza de Minas (CAM) is uncertain because since 1986 the company has made regular losses; only a drastic cost-cutting may enable CAM to continue operating at reduced levels for about 5 years, otherwise a progressive closure of Alquife operations may be inevitable. The combined iron ore output of Germany and the United Kingdom was only 175 thousand tons.

54. In EFTA countries the level of iron ore output is also declining, and less than 24 million tons were produced in 1991. Sweden remains the major iron ore producing country in Western Europe. Despite the difficult operational conditions of the Malmbergt mine during the first quarter of the year, Swedish total output of 19.3 million tons in 1991 was just slightly lower than in 1990. LKAB produced 18.6 million tons, of which 9.2 million tons of pellets. LKAB, which might be privatized in the near future, has embarked on a new investment programme to consolidate its position in the world market. Decisions have been made to prolong the life

and increase the capacity of the Kiruna mine, and in addition a new 4 million tons pellet plant has been commissioned to start by 1995. On the other hand the Dannemora mine operated by SSAB was closed down in mid-1992.

55. In Austria, owing to high production costs and the low quality of the ore, iron ore production has been falling in recent years; a little more than 2 million tons was mined in 1991 for the own consumption of the Voest-Alpine group. Norway produced 2.2 million tons of iron ore concentrates and about 1.3 million tons of pellets since the Norwegian pellet producer, Sydvaranger, made recent investments for upgrading its beneficiation plants. Iron ore is no longer produced in Finland, and Switzerland never produced it.

56. In Turkey strikes have been affecting iron ore output, which declined from 6.1 in 1990 to 4.9 million tons in 1991. In view of the political unrest and the civil war in the former territory of Yugoslavia all economic activities including mining and iron and steelmaking dropped dramatically in 1991. Iron ore statistics are not available but it is estimated that iron ore output fell by about 40 per cent.

6. Latin America

57. In 1991 total iron ore output of Latin American countries decreased to 192 million tons, but the region remains the leading world supplier. Brazil reduced its iron ore output from 152.3 million tons in 1990 to 150.7 million tons in 1991, as a result of lower world demand. It maintained, however, its position as the third largest producing country, and Cia. Vale do Rio Doce (CVRD) remains the world biggest iron ore producing company. CVRD's total production was 112.7 million tons of which 70 per cent was exported, including the pellets produced by its associated companies. About 50 million tons of CVRD's 1991 output came from the Minas Gerais and Espirito Santo mines, in particular the Itabira complex which has operated for nearly 50 years and last year celebrated the extraction of 1 billion tons. The Carajas project is currently producing 35 million tons annually, and apparently with a relatively small additional investment its scale of production can be expanded to up 50 million tons. This possibility seems to be under consideration and may materialize depending on the market situation and the evolution of prices.

58. Recently the first-phase expansion programme of Mineraçoes Brasileiras Reunidas (MBR) started. This will bring MBR's overall production capacity to 27 million tons by 1994, and eventually to 36 million tons during the next ten years. At its initial stage this project includes the extension of a railway by 52 Km to facilitate shipments, an increase of the stockyard capacity at the loading place, and higher extraction at Pico's mine. In May 1992, a mining pit collapsed at the main MBR's Aguas Claras, and two months are needed to resume operations to normal; however, given the high level of stocks, shipments scheduled for the first half of 1992 are unlikely to be affected. Samitri and Samarco, other large iron ore producers in Brazil, have also announced plans to increase their current annual production capacity to 13.4 millions and 9.6 million tons respectively within the next two years. In 1991, iron ore output from Ferteco remained at a level close to 11 million tons.

59. In Venezuela iron ore production remained at the level of 20 million tons in 1990 and 1991. CVG Ferrominera is presently operating 4 iron ore mines and is undertaking a major expansion programme with a view to doubling its production within the next 10 years. Venezuela's strategy however is to reinforce its position as the world largest supplier of higher value-added DRI. Under this policy, emphasis has been given to the construction of additional pelletizing capacity to meet the growing domestic demand of new DRI plants. The increase of Venezuelan iron ore production is planned for the domestic market, as exports are expected to be maintained at current levels. The target for 1993 is to produce 25 million tons of iron ore.

60. Chile produced 8.7 million tons of iron ore in 1991 almost 1 million ton more than in 1990. Compania Minera del Pacifico, the only iron ore mine operator in the country, is currently developing a new mining district at Los Colorados to provide additional ore to the expanding pellet plants, which produced more than 4 million tons in 1991. In Mexico despite the lower iron and steel production, iron ore output in 1991 apparently remained at 8 million tons. As the deposits from the La Perla are depleting, mining at Hercules operations is planned to increase in order to meet the demand of the Ahmsa steelworks.

61. Peru showed signs of slight improvement of mining activities in 1991. Hierro Peru, which is still operating at reduced capacity rates, produced last year 3.6 million tons of iron ore of which nearly 1.4 million tons of pellets, but expects to rise moderately total output in 1992. The restructuring and privatization of Hierro Peru is under-way and aims at improving its financial position, rehabilitating its operations and cutting costs[18]. In Bolivia the Empresa Minera del Oriente mined 100 thousand tons of iron ore in 1991, which accounts for only 20 per cent of its current capacity. Nevertheless, a policy to enhancing the Bolivian mineral sector with the participation of the private sector is being implemented.

7. North America

62. Compared with the weaker steel market conditions which prevailed in the region, the decline of iron ore output in North America to about 91.5 million tons in 1991 was relatively small, and an improvement is anticipated for 1992. In the United States 55.5 million tons of iron ore were produced in 1991 by 20 companies operating 22 mines, 16 concentration plants and 10 pelletizing plants. However, seven mines operated by four companies accounted for almost 90 per cent of total United States output[19]. According to the American Iron Ore Association, while the United States iron ore production declined by less than 2 per cent in 1991, consumption was 14 per cent below the 1990 level. Given its low grade, nearly all ore had to be concentrated and pelletized and the last active natural ore mine of the Lake Superior District was closed permanently in September 1991. The number of active pellet plants has also been further reduced.

63. In Canada the four remaining iron ore mines produced 36 million tons in 1991, a level slightly higher than the previous year. Canadian production of non-agglomerated concentrates increased but pellets output declined. Quebec Cartier Mining (QCM) had a better performance in 1991 producing about 16 million tons; after increasing the lifetime of its mining operations, QCM focused on managerial changes and improvement of quality control. The other major producer, Iron Ore of Canada (IOC) has new ownership control and also improved output in 1991 to 15 million tons; aiming at higher productivity and lower operational costs IOC is reducing its workforce and scheduled a temporary shutdown of the mines during the summer of 1992. Wabush Mines is downsizing its mining and pelletizing operations in eastern Canada by 25 per cent, lowering the production capacity of the joint-ventures from 6 to 4.5 million tons.[20]

8. Oceania

64. Attracted by the continued growth of iron ore demand in Asia and the advantage of its neighbouring location to supply this market, iron ore output in, and exports from Australia reached new records. During the 1990/91 period, iron ore production increased from 112 to 118.6 million tons. As further production capacity expansions are taking place, Australian iron ore output is planned to reach 135 million tons by 1995/96.[21] Hamersley Iron produced an all-time high level of 50.5 million tons in 1991 and expects to increase its annual iron ore production capacity to 55 million tons by 1995. Hamersley main operations are the mines of Tom Price, Paraburdoo and Channar, but in addition in June 1992 production from Brockman No.2 started at an annual rate of 4 million tons. The development of the Marandoo Project, however, is behind schedule because only by mid-1992 the project got final environmental clearance from the Australian government. Marandoo's development work is now planned to start in January 1993 and be completed in 1995. For 1992, Hamersley had planned to produce the same level as in 1991, but the mid-June strikes may affect its annual performance.

65. In 1991, BHP Iron Ore produced 45.5 million tons of iron ore from its Australian combined operations of Mt. Newman, Goldsworthy, Koolan Island and Iron Baron. Production from Whaleback has almost returned to normal but in view of weaker market conditions its output may be reduced again in 1992. As scheduled the first shipment from the new Yandi project was made in March 1992, and this year output might be 4 million tons; however, it seems that Yandi capacity can be quickly expanded to 5 or even 10 million tons depending on world demand. Robe River, the third largest Australian iron ore company, celebrated its 20th year of operations with a record output of nearly 25 million tons in 1991. However, due to depressed market conditions Robe River revised downward its production plans for 1992, as well as its expansion program.

66. Since 1968 iron sand is produced in New Zealand, and reserves at current level of exploitation can apparently hold for another 10 years. New Zealand Steel Mining operates the Taharoa iron sand plants, the capacity of which is estimated at 3 million tons. Output in 1991 was 2.3 million tons, of which about 1.2 million tons will continue to be exported to Japan for the next seven years.

C. Financing and investments

67. The combination of lower metal prices, drop in demand, difficult access to capital and high interest rates, affected mining investments in 1991. In the case of iron ore, however, after two boom years, the slowing-down of the market has contributed to scaling down some over-optimistic plans. Many companies, competing for larger market shares, were considering ambitious expansion programmes at the same time. The iron ore industry should be extremely prudent when forecasting medium to long-term demand. Lessons from the recent long period of over-supply and depressed prices should not be over-shadowed by short-lived boom years.

68. A close monitoring of recent market developments indicates the need for some new investments and reinvestment decisions in production capacity. Nevertheless, considering the long lead times needed to develop a project, a selective choice taking into account a realistic cost/benefits analysis and the comparative advantage of different project, seems imperative to maintain a balanced market in the interest of both producers and consumers.

69. The year 1991 also witnessed a drop in expectations and growing uncertainties about investments in Eastern European countries, given the aggravation of the economic crisis. In the metallurgical sector of the former USSR only 80 per cent of the planned volume of capital investment for replacement of outgoing capacities were made available. To cope partially with this problem a special mechanism to transfer funds was created and some iron ore capacities were put into operation: 2.2 million tons at the Stoilensky mining and ore preparation plant, and 1 million ton for production of iron ore concentrates.[22] Despite the gradual implementation of liberalization and privatization policies, and recent laws on foreign investments, calls from Eastern European countries for joint-ventures have not yet led to positive responses. In Latin America, however, thanks to more favourable attitudes toward foreign mining investments and new mining incentives and taxation schemes, the region has been attracting greater capital investment flows for the mining sector over the last two years.

70. Financing requirements for the great majority of ongoing iron ore expansion projects are being met by loans from private banks, which in general favours large mining companies with promising risk/reward ratio. As a result, the big iron ore companies are becoming stronger and the iron ore business increasingly dominated by large mining groups. For new-comers which are seeking financing it has been hard to mobilize adequate funds. For the development of Senegal's MIFERSO project, even if negotiations with multilateral institutions continue, private financing arrangements are being made on the basis of letters of intent from potential buyers, which have to be replaced by firm long-term sales contract.

71. During the period 1991/92 few iron ore projects benefitted from loans from international institutions. The EEC, through the European Investment Bank granted a loan of ECU 30 million, under the Lome Convention scheme, for the development of the M'Haoudat project in Mauritania, the total cost of which is estimated at ECU 155 million. Additional funds for this project will also be provided by the Arab Fund for Economic & Social Development and the African Development Bank. The Swedish company LKAB is also seeking financing assistance from the EEC for its investment plans on iron ore. The African Development Fund is considering the financing of a strategic study of the mining sector in Guinea, since apparently there is no concrete commitment from any multilateral institution for the financing of the MIFERGUI project.

Table 7

Investment plans for iron ore, 1991-1992

Region	Number of projects		Investments ($US million)	
	1991	1992	1991	1992
Africa	4	4	1,166	1,360
Asia	1a	7	128	1,428b
Western Europe	-	3	-	-
North & Central America	4	2	434	404
South America & Caribbean	4	6	338	368b
Oceania	4	5	625	720
Total	17	27	2,691	4,280

Source: UNCTAD secretariat.
a Includes small projects in China.
b Not including the full cost of all the projects.

See also: Annex I - Iron ore mining projects: new mines and capacity expansion.
Annex II - Iron ore mining projects: closures and capacity reduction.

IV. TRADE IN IRON ORE

72. While production declined, iron ore trade remained high in 1991 thanks to the continuous dynamism of the Asian markets. Total iron ore traded in the world market was 396 million tons in 1991, about 1 million tons higher than in 1990. The sharp drop of exports from the former USSR and Liberia, were in both cases due to production cutbacks rather than trade constraints. Noteworthy was the big increase of Australian exports and the recovery of Canada. Brazil maintained its level of exports, but might have lost its leading position to Australia (if exports from both countries are compared in natural weight tonnage). Therefore, 1991 pointed to important changes in the market share of the 10 major iron ore exporting countries. On the importing side, noticeable is the ever-growing level of iron ore imports into the Republic of Korea and in China, while in contrast there was a generalized fall of imports into the Eastern European countries. Japan strengthened its position as the world largest importer, but Germany's market share remained unchanged despite the addition of its Eastern territories.

Table 8

Major iron ore trade partners - 1990,1991

Major exporters	Share (%) of world exports		Major importers	Share (%) of world imports	
	1990	1991		1990	1991
1. Brazil	29.0	29.0	1. Japan	31.5	32.6
2. Australia	24.4	28.2	2. Germany*	11.0	11.1
3. Canada	6.8	7.5	3. Republic of Korea	5.7	7.3
4. India	8.0	7.3	4. Belgium/Luxembourg	5.1	5.0
5. Former USSR	9.2	6.9	5. China	3.6	4.7
6. Sweden	4.1	3.9	6. France	4.7	4.7
7. South Africa	4.3	3.9	7. Italy	4.3	4.6
8. Venezuela	3.4	3.4	8. United Kingdom	3.7	3.5
9. Mauritania	2.9	2.5	9. United States	4.5	3.4
10. Chile	1.7	1.9	10. Czechoslovakia	3.6	3.1

Source: UNCTAD secretariat
* For 1991, unified territory

73. In 1991 the value of world trade in iron ore reached the record level of US$8.55 billion. The increase over the trade value of 1990 reflected mostly the increase of export prices rather than the increase in volume which was marginal. Iron ore, ranked first in terms of value and volume among the non-precious ore commodities. It also has an important place in the balance of trade of its major exporting countries. At present iron ore ranks as the export earning product no.1 for Brazil and Mauritania, and no.5 for Australia. Iron ore companies located in countries with favourable exchange rates against the US dollar, reported good returns in 1991. Iron ore trade circles welcomed the recent removal of export controls by the

Australian government. In contrast, the inverse situation may occur in India due to the growth of domestic demand and a changing policy encouraging greater processing of commodities. Table 9 below shows the recent evolution of iron ore exports for the 10 major exporting countries.

Table 9

Major iron ore exporting countries, 1982-1991
(millions of tons - natural weight)

	Country	1982	1985	1989	1990	1991	1991/90 Change (%)
1.	Brazil	72.7	91.8	111.6	114.3	114.7	+0.3
2.	Australia*	72.7	86.9	104.5	96.1	111.5	+16.0
3.	Canada	27.2	32.1	30.2	27.0	29.7	+9.6
4.	India	24.4	28.8	33.5	31.6	29.0	-8.2
5.	Former USSR	42.8	43.8	39.8	36.4	27.4	-24.6
6.	Sweden	12.6	18.3	17.5	16.4	15.5	-5.7
7.	South Africa	11.4	10.2	14.6	17.0	15.5	-9.2
8.	Venezuela	6.6	9.0	14.4	13.6	13.3	-2.1
9.	Mauritania	7.7	9.3	11.1	11.4	10.0	-12.0
10.	Chile	5.6	4.8	7.4	6.5	7.4	+13.1
	World total	325.4	376.6	420.3	394.5	395.6	+0.3

Source: UNCTAD secretariat -"Iron Ore Statistics, 1982-1991".
* Dry basis

74. Japan strengthened its position as the largest market for iron ore. Even if for the first time in five years, crude steel production slightly declined total iron ore imports into Japan increased to 127.2 million tons in 1991, only 500 thousand tons lower than the record of 1989. In 1991, the three major supplying countries together accounted for nearly 85 per cent of total Japanese imports, but Australia was the only country which has increased its market share. Fines remains the most consumed ore type in Japan accounting for more than 60 per cent of total consumption, followed by lumps (about 25 per cent), pellets (around 5 per cent), and the remaining of sintered ore and iron sands.

Table 10

Iron ore imports into Japan - 1990-1991
(millions of tons)

Origin	Non-agglomerated		Agglomerated		Import share (%)	
	1990	1991	1990	1991	1990	1991
Australia	52.2	58.0	1.7	0.4	43.0	45.9
Brazil	26.2	23.9	4.0	4.6	24.1	22.4
India	20.7	20.7	-	0.2	16.6	16.4
Philippines[a/]	-	-	4.8	4.9	3.8	3.8
South Africa	4.8	5.0	-	-	3.8	3.9
Chile	2.3	2.3	1.7	1.9	3.2	3.3
Canada	1.9	1.7	-	-	1.5	1.3
Venezuela	1.8	1.4	-	-	1.4	1.1
New Zealand[b/]	1.3	1.3	-	-	1.0	1.0
Peru	0.4	0.4	0.5	0.4	0.7	0.6
Sweden	0.4		0.2	-	0.5	-
Mauritania	0.2	0.2	-	-	0.2	0.1
Others	0.2	0.3	-	-	0.2	0.2
Total	112.4	115.2	12.9	12.0	100	100

Source: UNCTAD secretariat - Iron Ore Statistics, 1982-1991
a/ Sintered ore.
b/ Iron sand.

75. During the first half of 1992 as steel domestic demand dropped considerably and iron ore stocks were very high, the iron ore situation in Japan was reversed. The cumulative iron ore import volume during January–June 1992 fell by 13 per cent from the corresponding period of 1991. It is felt that the bottom of the crisis is over and a slow recovery is foreseen for the second half of the year, but the volume of total iron ore imports into Japan in 1992 is likely to be at least 10 million tons lower, as compared with the exceptionally high level of 1991.

76. The EEC market remained relatively stable in 1991. Iron ore imports totalled 126.7 million tons (including EEC's internal trade), about 2.4 million tons lower than in 1990. Apart from Italy and Portugal where slight increases occurred, in all other EEC countries there were moderate declines, reflecting the softening of steel activities. Despite the enlargement of Germany's territory, total iron ore imports into Germany have not increased in 1991 due to the slowing down of the German economy, and the reduction of steel capacity and output in the Eastern part of the country. Regarding Germany's iron ore trade it seems that in practice no changes have yet occurred; the two traditional iron–ore buying agencies continued to act for the former Federal Republic steel industry only – a situation which may change in the near future.

77. For 1992, the overall iron ore situation in the EEC region is likely to remain fairly similar to that of 1991. During the first half of the year total pig iron output was only 1 per cent lower than in 1991, and steel production may show a more positive development in the second half of 1992.

Table 11

EEC's iron ore imports by origin/destination - 1991
(million tons, natural weight)

Origin \ Destin.	Germany	France	Italy	Neth.	Bel/Lux.	U.K.	Spain	Portugal	EEC[a/]
Non-agglomerated									
Total	28.5	17.2	15.7	7.9	19.0	11.3	5.3	0.2	99.5
of which:									
Australia	5.7	4.2	1.9	1.7	1.5	2.5	0.9	-	18.3
Brazil	13.4	5.5	5.5	2.3	6.7	2.3	1.8	0.1	37.5
Canada	4.9	1.3	0.5	0.8	0.8	1.9	0.3	0.1	10.5
Liberia	-	0.7	0.1	-	-	-	-	-	0.8
Mauritania	0.4	1.7	3.2	0.1	2.1	0.9	1.2	-	9.6
Norway	0.1	0.4	-	1.5	0.3	0.1	-	-	2.4
South Africa	0.5	0.4	1.4	0.1	0.1	1.5	-	-	4.0
Sweden	2.6	0.6	-	-	2.3	0.3	-	-	5.8
Venezuela	0.7	1.2	1.7	0.4	1.6	0.5	1.0	-	7.1
Others	0.3	0.8	1.4	0.5	0.3	0.1	-	-	3.4
Agglomerated									
Total	14.8	1.0	2.2	-	0.5	2.3	2.3	0.2	23.3
of which:									
Australia	-	-	-	-	-	0.4	-	-	0.4
Brazil	6.6	0.3	1.4	-	0.1	-	1.8	-	10.2
Canada	3.2	0.6	0.5	-	-	0.7	0.4	0.1	5.6
Norway	0.8	-	-	-	0.2	0.7	-	-	1.7
Sweden	3.1	-	-	-	0.2	-	-	-	3.4
Others	1.1	0.1	0.3	-	-	0.5	-	0.1	2.1
Total	43.3	18.2	17.9	7.9	19.5	13.5	7.6	0.5	122.8

Source: - EUROSTAT and UNCTAD secretariat
(Differences due to rounding)
a/ Third countries only.

78. In Eastern Europe, with the worsening of the economic situation, total iron ore imports dropped sharply by more than 30 per cent. The former USSR, the only intra-regional iron ore supplier, was severely affected, while the impact for other exporting countries, and for world trade in general was limited. Total exports from the former USSR were 27.4 million tons in 1991, about 9 million tons lower than in 1990; of this total, exports to other Eastern European countries declined from 34 to 22 million tons in 1991. This explains the efforts made by the former USSR minerals trading organizations to expand sales to other countries, and the sudden increase of ore from the former USSR in the European spot market. However, as internal transportation and shipments arrangements remained a major problem, apparently very few new iron ore deals with Western buyers really materialized. For a major mineral commodity exporter, the intra-regional trade situation is further aggravated because most barter deals are coming into force, and new adequate mechanisms to support the restructuring of the external trade are not yet operational. Table 12, shows the breakdown of iron ore imports into the region in 1991, based on available data.

79. In 1992, with the decentralization of economic activities in the republics of the CIS, Ukraine emerged as the major iron ore producer of Eastern Europe, since about one third of total iron ore produced by the former USSR originated from that republic. However, in view of the current low level of production and sales the Ukrainian Government is welcoming any form of foreign investment to activate the minerals mining and the iron and steel sector. The Russian Federation, more experienced in the world market, continues to play a dominant role in CIS iron ore transactions, particularly thanks to previous links with iron ore buyers of the region. In 1991, Russian iron ore exports totalled 9.8 million tons, of which more than 7.5 million tons to traditional Eastern European customers. A new ferrous raw materials organization known as MRA was created in Vienna in 1991, with the objective to centralize the buying of iron ore and coking coal of major central and eastern companies from non-regional sources. In the Russian Federation as new private minerals trading companies are being established, the traditional state trading organizations have lost their monopoly but they remain very active [23]. A similar situation is taking place in other Eastern European countries. In the case of Ukraine, future exports of iron ore, coal and steel products are to be dealt independently by newly created local companies. These developments will, undoubtedly, re-shape some of the current practices of iron ore trade inside and outside the Eastern European region.

Table 12

Eastern European iron ore imports by origin/destination, 1990-1991
(million tons, round figures)

Destination / Origin	Czechoslovakia		Poland		Romania		Hungary		Bulgaria	
	1990	1991	1990	1991	1990	1991	1990	1991	1990	1991
Former USSR	12.5	10.2	10.0	5.8	7.3	4.2	2.5	1.4	2.0	0.6
Brazil	1.1	0.9	0.4	0.9	0.9	0.7	-	0.1	-	-
India	0.1	0.1	-	-	2.7	1.9	-.5	0.6	-	-
Sweden	0.1	0.1	0.2	0.1	-	-	-	-	-	-
Venezuela	0.2	0.1	0.3	0.6	-	0.1	-	0.9	-	-
Total (incl. others)	14.2	12.0	11.0	7.4	11.3	7.4E	3.2	3.0E	2.0	0.6

Source: UNCTAD secretariat - "Iron Ore Statistics 1982-1991".

(E) = Estimate.

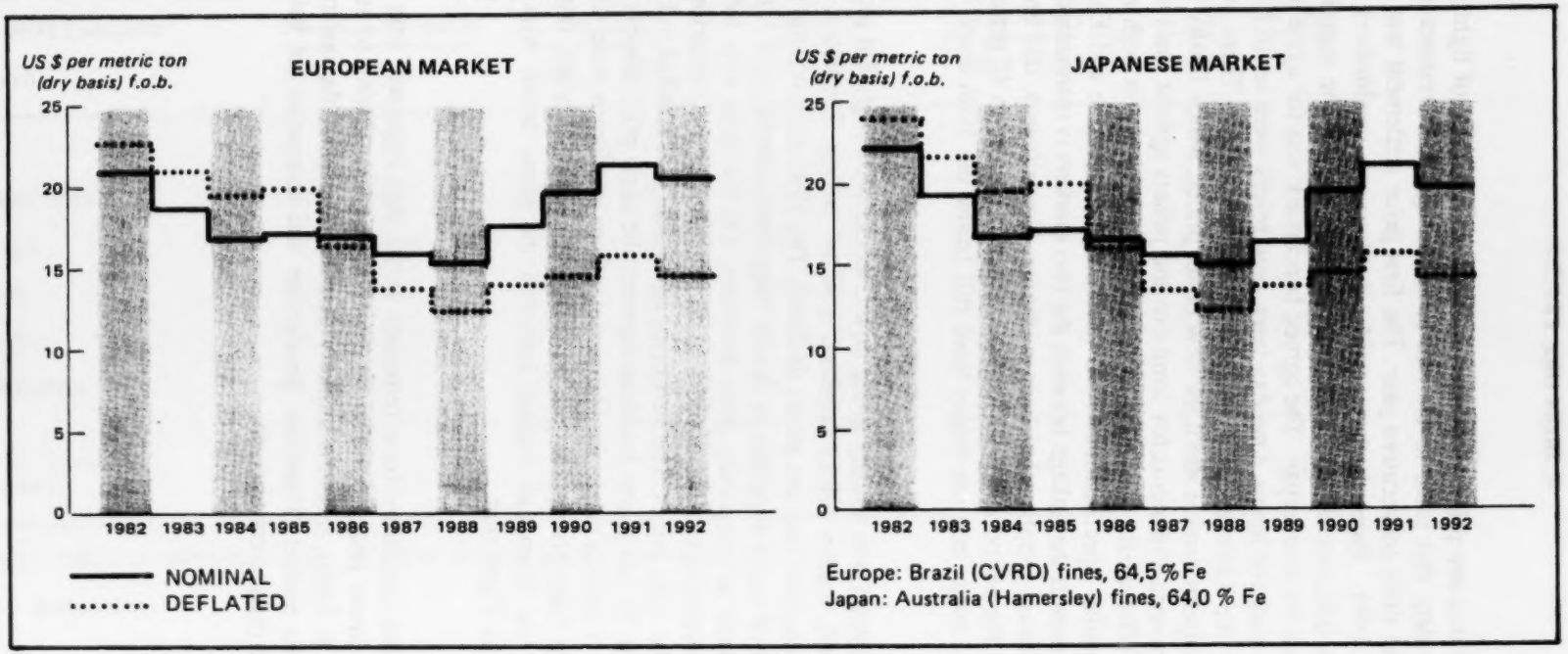
V. IRON ORE PRICES

80. The recovery of iron ore prices continued in 1991. In a climate of tight supply/demand balance, it became evident that price levels had to encourage re-investments, and iron ore prices increased for the third consecutive year. The first price settlement was made in Japan at the end of January 1991. From the buyers side, the Japanese steelmakers represented by Nippon Steel took the initiative to lead price negotiations, and for the suppliers Hamersley Iron from Australia was the counterpart. The agreed benchmark was for a rise of 7.93 per cent for fines and 5.95 per cent for lumps. One day later, new prices were set in Europe basically at the same level by the German mills and the Brazilian CVRD. There were, however, divergences in the European market about the new pellet prices, which finally had a marginal increase of about 1 per cent. Premiums for lump ore and pellets against fines and pellet-feed were reduced. Price differentials continued to be applied uniformly in both markets for all brands according to quality specifications. However, as the Japanese and European pricing policies are different, even if the linkage between the two markets is maintained, the price gap between nearby and distant suppliers has been widening. Nevertheless, this brought the total cumulative rise during the period 1989-91 for the standard fines ore to 41 per cent in nominal terms, although in real terms iron ore prices were still below the 1986 level. (See chart 3).

81. For 1992, as demand was already going down, stocks were high, but production failed to be promptly adjusted, market forces favoured iron ore buyers. Therefore, in a relatively smooth round of negotiations iron ore prices declined. The 1992 drop of iron ore prices also reflected the approach of major suppliers to favour long-term assurance of higher contracted tonnages to the detriment of temporary price increases. On the other side steelmakers were pressing for lower commodities prices in order to compensate for their deteriorating financial position affected by low steel prices. The first price agreement was reached in December 1991 for the 1992 fiscal year, by Japan and Australia between the same price leaders for the second consecutive year. The reference prices for Hamersley's fines and lumps were fixed at -4.9 per cent and -6.4 per cent respectively. Despite the different market situation, immediately after price settlements for the European market followed the same trend, with pellets prices declining on average by 7 per cent.

82. In 1992, as market conditions have remained worse than expected, iron ore sellers are being hit not only by lower prices but also by lower shipments. Owing to steel production cutbacks, particularly in Japan, it seems unlikely that the totality of the contracted tonnages will be absorbed by the market. Therefore, production and shipments are being adjusted to respond to the current market contraction.

Chart 6
IRON ORE PRICES 1982-1992, NOMINAL AND DEFLATED[a]



Notes: [a] Nominal prices deflated by the United Nations index of unit value of exported manufactured goods (1980 = 100)
For the Japanese market, prices are effective from April/March (fiscal year).
For 1992, deflated index is estimated based on the first half of the year.
Price in Japan converted from DLT (dry long ton) to DMT (dry metric ton). Convertion factor = 1.016047.

Source: UNCTAD secretariat

VI. TRANSPORT COSTS AND FREIGHT RATES

83. As a result of lower inland and waterways trade inside Eastern Europe and North America, and higher shipments by sea into Asia, the proportion of total iron ore trade accounted for by seaborne trade increased to almost 90 per cent in 1991. Since this trend is likely to continue, three emerging issues have to be faced: (i) the diversification of markets is increasing the importance of shipping costs and freight rates to the iron ore market; (ii) the need to improve predictability regarding the evolution of freight rates; and (iii) the need to assure that the aging of the current dry bulk fleet will not affect iron ore trade in the near future.

84. Furthermore, the growing importance of the Pacific basin, the growing dominance of large-scale producers, and the growing use of ultra-large vessels have become a reality and are re-shaping the pattern of iron ore trade. Recently several accidents occurred, resulting in serious damages or even losses, involving fully loaded iron ore carriers [24]. It would seem that lower freightage rates are not compatible with modern and secure vessels.

85. In 1991 the freight markets was characterized by big fluctuations between the very high levels of the first quarter contrasting with the extremely low level by the end of the year. Nevertheless, for the whole year freight rates were on average high, as shown in table 13 below. Since the end of 1991 rates became lower and lower during the first half of 1992, in particular for the Capesize spot sector, i.e., vessels with capacity between 80/150,000 dwt[25].

Table 13
Freight rates for iron ore in the single/voyage charter market
($US per DWCT)

Trade routes		1983	1985	1989	1990	1991d/
Eastern Canada-Europe[a] (110-130,000 DWCT FIO)	H	3.5	5.0	8.8	8.3	7.5
	L	3.0	2.4	5.7	3.9	5.0
	A	3.3	3.6	7.1	5.6	6.1
Liberia-Europe[a] (60-80,000 DWCT FIO)	H	4.7	5.2	8.7	7.9	7.8
	L	3.6	3.2	5.8	5.3	6.1
	A	4.2	4.2	6.9	6.5	6.9
Brazil-Europe[a] (80-100,000 DWCT FIO) (120-160,000 DWCT FIO)c/	H	5.9	6.8	8.8	8.0	8.8
	L	4.5	4.0	6.8	5.2	6.3
	A	5.1	5.7	7.5	6.7	7.5
Brazil-Japan (90-110,000 DWCT FIO) (125-155,000 DWCT FIO)c/	H	8.9	9.0	15.5	15.2	13.5
	L	7.5	7.5	12.2	10.3	11.7
	A	8.2	8.0	13.7	12.6	12.9
Western Australia[b/]-Europe[a/] (120-140,000 DWCT FIO)	H	10.8	9.0	11.5	10.7	11.2
	L	6.0	5.7	8.7	7.7	9.5
	A	7.6	7.3	9.6	9.4	10.3

H = Highest month L = Lowest month A = Average of 12 months
FIO = free in and out DWCT = Dead weight cargo tonne

Source: Drewry Shipping Consultants Ltd.
a/ Discharge Antwerp-Rotterdam-Amsterdam (ARA) range of ports.
b/ Load Cape Lambert, Dampier or Port Hedland.
c/ 1988, 1989, 1990 and 1991.
d/ Estimate.

VII. TECHNOLOGICAL AND ENVIRONMENTAL ISSUES

86. The United Nations Conference on Environment and Development, held in Rio de Janeiro in June 1992, addressed broadly-based environmental policies calling for concerted action at the international level, and called for more concrete measures on environmental protection. The year preceding the Conference was marked by intensive debates to refine concepts, to examine the links between economic development and the environment, and to design and promote environmentally sound policies and programmes. In this context, a round-table on "Mining and Environment"[26] held in 1991 addressed the central issue of long-term sustainable development of the mining industry in countries with different level of industrialization. As a result of the discussions held between governments, mining companies and mineral industries, two major steps were put forward: First, a set of environmental guidelines partly addressed to the mineral sector, but also attributing responsibilities to multilateral assistance agencies; secondly, the concept and practice of environmental management to guide mining projects throughout their lifecycle[27]. This would complement the conventional environmental impact assessment which until now was limited to the phase of feasibility studies.

87. Principle 2 of the Rio Declaration recognizes that countries have the rights to exploit their own natural resources, but also recalls their responsibility to ensure that these activities do not cause damage to the environment of other states.[28] Therefore, mining activities from excavation to refining, are currently subject to more stringent environmental regulations. Consequently, the direct and indirect effects of mining such as the disturbance of the surface, accumulation of wastes, as well as its damaging effects on the soil, air and water resulting from concentration, processing or smelting should be subject to better control. The search for cleaner technologies and the implementation of better monitoring programmes to measure the quality of air, dust, noise and liquid effluent is becoming a priority, at least for big mining groups. However, the question of costs and transfer of technology remains crucial, particularly for the mining industry of developing countries. In Mauritania for instance, since 1989 SNIM invested nearly US$ 10 million for the installation of modern electrostatic filters in order to reduce the annual 200 thousand tons of polluting dust originating from the Guelbs project.[29]

88. In the field of iron ore agglomeration the major environmental problem is the emissions from the sinter plants. Obsolete plants if not modernized with cleaner equipment, will inevitably have to close. This has already happened in Western Europe and now will be the turn of Eastern European countries. Nevertheless, research for appropriate environmental-friendly technologies continues. For instance, the result of a 2 years research programme is the new dedusting technology for sinter plants which is being tested by Voest Alpine in Austria.

89. For pelletizing which is already a cleaner process, new pollution control systems are proving effective. An example is the CVRD's air and water monitoring network, installed in the industrial area of Tubarao to control the emissions of SO2 and SO3 of pellets plants, as well as the release of liquid effluent recovering it into industrial water[30]. As regards technical advances, a new achievement in pelletizing is the new column flotation circuit installed by Samarco in Brazil to reduce the silica content of the final pellet product while maintaining overall iron recovery.

90. A recent environmental issue involving the iron ore mining industry concerns the development of the Marandoo project in the Pilbara region in Australia. There was a claim by the Karajini aboriginal community considering that the project area was located in a protected Aboriginal heritage site . After re-examination of the Aboriginal Heritage Protection Act and introduction of a new legislation, the project finally received governmental approval to proceed and is due to start operations in 1995.

91. Iron and steelmaking became a highly environmentally vulnerable sector, since it generates virtually all types of pollution: air and water pollution, noise, heat, and waste generation. While consuming huge volumes of natural resources, energy and water, it is a major source of carbon dioxide (and other gases such as sulphur and nitrogen oxides etc). Theoretically it was estimated that close to 1.2 tonnes of carbon dioxide is generated per tonne of blast furnace pig ironmaking, apart from the big carbon emissions resulting from the burning of coke oven gas and other combustion processes used for the production of iron and steel[31]. Recent studies assume that the iron and steel industry is responsible for 5-7 per cent of the world's total carbon dioxide emissions, equivalent to around 30-35 per cent of total emissions produced by all industrial branches.

92. The existing pollution control systems used by the big majority of the iron and steel industries, in particular the large integrated steel works, are inadequate to meet the newly regulated environmental parameters. Apparently, from the technical point of view, solutions to curb the major problems have been found, but the huge costs involved remain the major constraint. In the United States for instance, the impact of the 1990 Clean Air Act Amendments on the iron and steel industry could require capital costs ranging from $11.5 to $380 million dollars per million ton of coke production depending on the control option, or even up to US$ 2.6 billion in the case of the most polluting coke plants in Pennsylvania and Indiana.[32] In Japan, according to the Institute for Social and Economic Affairs, since the 1970s the Japanese iron and steel industry invested a total of US$ 11 billion in environment protection, not only in air pollution countermeasures to prevent acid rain, but also in energy-saving measures to prevent global warming.[33] In Latin America, environmental expenses by the steel industry are also increasing as indicated by the example of Usiminas in Brazil which already invested US$ 162 million since 1984 on water, air and noise control, and an additional US$ 120 million are planned for the next five years[34].

93. In parallel, research to develop cleanest and less costly technology for reducing or eliminating coke emissions continues. The first cokeless COREX ironmaking plant has been now in operation for the past two years in South Africa producing annually 300 thousand tons of liquid iron virtually through a pollution-free operation. Despite its reported success, in order to make this process more competitive, further research seems to be needed to allow bigger plant capacity and to reduce costs derived from the high hydrogen consumption. In Australia, a new ironmaking technology named HIsmelt, supposed to be simpler, cleaner, faster and cheaper than existing methods is being tested by CRAMidrex to assess the commercial viability of this technology, which was first developed in a pilot plant in Germany[35].

VIII. SHORT-TERM OUTLOOK FOR IRON ORE

94. The world economy weakened during the first half of 1992. Noteworthy however, was the changing economic environment in major OECD countries. The recovery in the United States contrasted sharply with the slowing down of the Japanese and German economies, which had been overheated since 1989. In both countries, lower investments acted as a brake on the growth of the main steel consuming industries, affecting the level of crude steel output, particularly in Japan, where the fall was sharper than expected. As Japan and Germany are the major markets for iron ore, the overall impact for the world iron ore market is not easily absorbed. During the first half of 1992, iron ore imports into Japan declined by 13 per cent which was more than 8 million tons lower than the exceptionally high level of the same period in 1991.

95. In other regions iron ore demand is following the same trend as in 1991. In EEC, the level of crude steel production and iron ore consumption remains steady. In Eastern Europe drastic falls continue, with crude steel output and iron ore demand dropping by about 12 per cent during the first half of the year. In developing countries of Asia, including China, iron ore demand is still growing, albeit at a slower rate. For the second half of 1992 steel demand is expected to start picking up gradually in OECD countries. In Japan, steel demand may begin to recover late in the year, reaching a more stable level in 1993. However, as the growth of the Japanese economy is likely to be slower in the coming years, no more peaks in iron ore demand similar to the ones of 1989–1991 are foreseen in the near future. However, the decline in Japanese demand is likely to be partially offset by the growth of iron ore consumption in developing Asian countries.

96. For the iron ore industry, 1992 is proving to be a difficult year. Prices have gone down and investments are going up. Market equilibrium is losing momentum since supply capacity is fast expanding at a time when demand is already contracting. Stocks are high, trade is declining and optimistic production plans would seem to require downward adjustments.

97. For 1993 more favourable market conditions are anticipated. World iron ore demand is likely to stabilize, although there are uncertainties about the timing and strength of the steel recovery in developed countries. Iron ore prices, however, may be influenced by the slight improvement of steel prices in 1992, better steel outlook for 1993, and the need to proceed with investments.

Annex I

IRON ORE MINING PROJECTS: NEW MINES AND CAPACITY EXPANSIONS - 1991-1992

Company	Location	Planned capacity	Investment ($ million)	Start	Notes
Africa					
SNIM	M'haoudat, Mauritania	6 MM mt/yr ore	170	1994	OR: 80 MM at 64% Fe-lumps/ fines
	El Aouj, Mauritania	11 MM mt/yr ore 5MM mt/yr pellets	350	1995	New project OR 150 MM at 40% Fe
MIFERGUI	Nimba Mts. Guinea	6-9 MM mt//yr ore	220	1995	OR: 600 MM at 66.7% fe-fines
MIFERSO	Faleme, Senegal	6-10 MM mt/yr ore	620	1997	OR: 610MM 62% Fe.lumps/fines. Includes a railroad and port facilities
Asia					
Government	Several locations, China	-	128	1995	13 projects: 8 new mines and 5 capacity expansions
National Mineral Dev. Corp. NMDC	Deposits No. 5, No. 11 and No. 14, Bailadila India	5 MM mt/yr ore	-	1994/95	Expanding the current capacity from 9.8 to 14.5 MM mt.
	Deposits No. 11-B, No. 10 and No. 11-A, Bailadila India	-	-	1990	Feasibility studies for new development
Kudremukh Iron	Mangalore, India	3 MM mt/yr pellets	-	1990s	Expanding pelletizing from 3 to 6 MM mt.
Central Iranian Iron Ore Company	Bafgh, Iran (Islamic Rep.)	3 MM mt/yr. concentrates	450	1995	Expansion programme

Nisco Company	Iran (Islamic Rep.)	2.7 MM mt/yr. concentrates	250	1993	Expansion programme
	Iran (Islamic Rep.)	5 MM mt/yr.	600	1996	- " -
North & Central America					
Sicartsa	Lazaro, Mexico	3MM mt/yr. pellets	104	1990s	Expansion programme
	Lazaro, Mexico	3MM mt/yr. conc.	300	1990s	- " -
South America					
CVG Ferrominera	Porto Ordaz, Venezuela	7-22MM mt/yr. ore	-	1991/95	Expanding and modernizing facilities to reach 25-40 MM
CMP-Romeral	Los Colarodos, Chile	1 MM mt/yr. pellet feed	-	1994	Expand pellet-feed capacity for the pellet plants
MBR	Minas, Brazil	5 MM mt/yr.	38	1995	New sinter-fee capacity - 1st phase expansion programme
Samarco	Mina Gerais, Brazil	10 MM mt/yr ore	50	1994	Replacement to continue and expand
Samitri	Minas Gerais, Brazil	2.5 MM mt/yr. ore	30	1993	Expanding capacity
Oceania					
Robe River Mining Ltd	Pilbara, Australia	24-32 MM mt/yr ore	80	1993	Expansion to existing capacity if new sales secured
BHP Iron ore Ltd	Pilbara, Australia	Initially 5 MM mt/yr ore Proposed 10 MM mt/yr	85	Feb 92	Greenfield project - expansion to 10 MM depends on market penetration for this new type of ore

Hamersley Iron Pty Ltd	Pilbara, Australia	4 MM mt/yr. ore (5-7 yrs)	50	mid-92	Greenfield expansion (new mine at Brockman Detrital)
Hamersley Iron	Pilbara, Australia	12 MM mt/yr. ore	500	late 94	Principally to extend life of Tom Price Mine (New mine at Marandoo)
Hancock Resources Ltd	Pilbara, Australia	5 MM mt/yr ore (5 years)	-	-	Currently on hold (new mine at Brockman Detrital)
Europe					
LKAB	Malmberget, Sweden	1 MM mt/yr ore	-	1992	Expanding life-time and capacity to 7 MM mt/yr
	Kiruna, Sweden	2 MM mt/yr ore	-	1995	Extending capacity from 13-15 MM mt/yr
	Kiruna, Sweden	4 MM mt/yr pellets	-	1995	New pellet plant

Source: UNCTAD secretariat based on the work of the Intergovernmental Group of Experts on Iron ore.
Notes: The information provided is not exhaustive; additional informationand revisions are welcome.
OR = ore reserves, MM = million, M = thousand, mt = metric ton, $ = US dollar.

Annex II

IRON ORE MINING PROJECTS: CLOSURES AND CAPACITY REDUCTION - 1991-1992

Company	Location	Reduction of capacity	Effective or planned date	Temp (T) Perm (P)	Notes
Africa					
LIMINCO	Yekepa, Liberia	Reduction from 6 MM to 1 MM/yr	1992	P	2 MM mt may be mined annually until the start of MIFERGUI
Bong Mining	Yekepa, Liberia	Reduction 6MM/yr conc & pellets	1991	P?	Dammnaged mining and pelletizing facilities
North & Central America					
Algona Ore Div.	Wava, Ontario Canada	1.1 MM mt/yr ore	1992	P	Pending final decision
Wabush Mines	Labrador, Canada	From 6 MM to 4.5 MM/yr	1992	T	Adjustment to market conditions
LTV Steel	McKinsley, Minnesota USA	-	Sep 91	P	Last active natural ore mine in Lake Superior
Europe					
SSAB	Dannemora, Sweden	0.6 MM mt/yr	June 92	P	--
Oceania					
BHP Iron Ore Ltd	Yampi, Koolan Island Australia	4 MM mt/yr ore	mid-93	P	Mine closing due to depletion of ore reserves

Source: UNCTAD secretariat based on the work of the Intergovernmental Group of Experts on Iron ore.
Notes: The information provided is not exhaustive; additional informationand revisions are welcome.
OR = ore reserves, MM = million, M = thousand, mt = metric ton, $ = US dollar.

Notes

1. According to the Common Data Base of the UN-ECE secretariat, the National Material Product (GDP equivalent in Eastern Europe) dropped by -1.4% in 1989, -9.5% in 1990, and further -14.1% in 1991.

2. See: OECD Press Release SG/PRESS (92) 7- Paris, 30.01.1992, OECD Press Release SG/PRESS (92) 32-Paris, 15.04.1992.

3. According to the OECD Economic Outlook, economic activity is recovering in countries where it had fallen, even though more slowly than expected in the United States; it is slowly picking up in countries where it had been weak; and it is slowing to a more sustained pace in Germany and Japan. Growth of real GNP/GDP in the OECD area is forecast to 2.7% in 1992 and 4.3% in 1993.

4. For a detailed analysis of economic developments and ongoing reforms in Central and Eastern Europe, see: Economic Survey of Europe in 1990-1991, and The ECE Economies in mid-1991, by the United Nations Economic Commission for Europe, Geneva, 1991.

5. See: Monthly crude steel production figures, by the International Iron & Steel Institute, Brussels, May 1992.

6. See: Siderurgia Latinoamericana,by Instituto Latinoamericano del Fierro y el Acero, Santiago, January/February 1992.

7. See: Mercosur accord detailed, at American Metal Market March 16, 1992; and Mercosul aims to free steel trade, Metal Bulletin, 16 March 1992.

8. A brief analysis of the mixed combinations of iron bearing materials currently used in steelmaking is discussed in the paper "The choice of ferrous metallics inputs for steelmaking", by E. dos Santos-Dulsenberg presented at the International Symposium on Steel Scraps, held in Algers in April 1992.

9. See: The benefits of Midrex Iron for Arab iron and steelmaking, paper presented by D. M. Faccone from Midrex Corp. at the International Symposium on Scrap, Algers, 1992.

10. Information compiled by Midrex Corporation and HYL S.A.See: Metal Bulletin, 13 February 1992 and SEASI Newsletter, March 1992.

11. See: Soviet DRI gains clout in US market, American Metal Market, October 10, 1991.

12. As reported by the American Metal Market in February 25, 1992.

13. The changing pattern of the scrap market was recently addressed in a paper by S. Rhinds, from Metal Bulletin at the International Symposium on Scraps held in Algers in April 1992.

14. See the tables on iron ore stocks at the UNCTAD publication "Iron Ore statistics 1982-1991" (TD/B/CN.1/IRON ORE/2).

15. For details on world sinter production figures, see "Iron Ore Statistics 1982-1991", UNCTAD (TD/B/CN.1/IRON ORE/2).

16. Reference is made to the article "Developments in the North American Iron Ore Industry" by M. Thomas Moore, published by the Skillings Mining Review.

17. See a number of articles published by Metal Bulletin of: November 7, 1991, 20 January and 16 March, and 6 April 1992.

18. In addressing the fifth session of the Intergovernmental Group of Experts on Iron Ore in October 1991, Mr.E. Zuniga Chairman of the Board of

Hierro Peru, presented "The restructuring of Hierro Peru and its privatization.

19. According to the Annual Report, 1990 of the U.S. Bureau of Mines.

20. See Skillings's Mining Review of May 2, 1992: "Canadian Iron Ore Industry in 1991" by B.W.Boyd, and Wabush Mines Downsizes Canadian Operations by 25%.

21. Reference is made to the study made by ABARE - Australian Bureau of Agricultural and Resource Economics on "Minerals and Metals Trade in the Asia Pacific Region", presented in a ESCAP Seminar held in Bangkok in December 1991.

22. According to information provided during the UN-ECE Meeting of Experts on the Steel Market, held in June 1992, Geneva.

23. As reported by Metal Bulletin of 9 May 1991 and June 15 1991.

24. See: The TEX Report dated of January 20, 1992 and Metal Bulletin dated of September 20, 1991.

25. For more detailed analysis on iron ore shipping issues, see: Annual Shipping Review - 1991, by SS&Y Research Services, Shipping Review and Outlook - Spring 1992, by Clarkson Research Studies; and Growth Prospects for Iron ore and coking coal - 1991,by Drewry Shipping Consultants.

26. The round-table on "Mining and Environment" held in Berlin in June 1991, was organized by the Development Policy Forum of the German Foundation for International Development(DSE) and the United Nations Department of Technical Co-operation and Development.

27. See: Environment Supplement of Mining Journal, September 20, 1991.

28. See: Rio Declaration on Environment and Development, adopted at the United Nations Conference on Environment and Development, Rio de Janeiro, June 1992.

29. See: SNIM Informations, No. 5, January 1992, published by Societe National Industrielle et Miniere, Mauritania.

30. See: Environment and Economic Development - The Experience of CVRD, Companhia Vale do Rio Doce, Rio de Janeiro, 1986.

31. Reference is made to chapter 5 - The iron and steel industry and the environment, from the Report I - Recent developments in the iron and steel industry, prepared by the International Labour Office to the twelfth session of the ILO - Iron and Steel Committee, held in April 1992 in Geneva.

32. According to a recent study 1990 Clean Air Act Amendments: technical/economic impact on U.S. coke and steelmaking operations by D. Prabhu and P. Cillone, from the United Engineers & Constructors Inc., Philadelphia. See also: Impact of 1990 Clean Air Act Amendments on the iron and steel industry, by B. Steiner, Vice President - Environment and Energy, American Iron and Steel Institute, Washington. Both published in the Iron and Steel Engineer, January 1992.

33. See: Japan's industries work for conservation of global environment, Japan Institute for Social and Economic Affairs, Tokyo, 1992.

34. See: Vocational training, retraining and skill development in the Latin America steel industry, by McKinsey & Co., Paris, 1991.

35. According to the Australian publications: Prospects, June-August 1991, and The Mining Review, December 1991.